

IN THE CLAIMS:

Please cancel claims 5 and 15 without prejudice; please cancel claims 24 - 46 without prejudice; and please amend claims 1, 4, 6 - 9, 13 - 14, 16 - 17, and 19 - 23 as follows.

1. (Once Amended, Currently Amended) A method ~~for~~ of forming a mask assembly for use in lithography comprising the steps of:
- forming a support structure that comprises a substrate that includes an initial plurality of windows ~~filled with a temporary fill~~;
  - filling the initial plurality of windows with a temporary fill material;
  - forming an additional plurality of windows in portions of said substrate which do not contain the temporary fill material;
  - filling the additional plurality of windows in the substrate with a temporary fill material;
  - forming over the filled-windowed substrate a mask; and
  - essentially completely removing the temporary fill material.
2. (Original) The method of claim 1 wherein the mask comprises a membrane layer covered by a mask layer.
3. (Original) The method of claim 1 wherein the mask is a stencil mask.
4. (Once Amended, Currently Amended) A method ~~for~~ of forming a mask assembly for use in lithography comprising the steps of:
- a) forming a support structure that comprises a substrate that includes a first plurality of windows ~~filled with a temporary fill~~;
  - b) filling the first plurality of windows with a temporary fill material;

c) forming an additional plurality of windows in portions of said substrate which do not contain the temporary fill material;

d) filling the additional plurality of windows in the substrate with a temporary fill material;

e) forming over the filled-windowed substrate a membrane layer for capable of supporting a mask layer; and

f) forming a mask layer over the membrane layer; and

g) essentially completely removing the temporary fill material.

5. (Cancelled Without Prejudice)

6. (Once Amended, Currently Amended) The method of claim 5 ~~in which the first partial set of windows is approximately one half of the total number of windows to be formed, and the second set includes the remaining windows to be filled~~ 4, wherein steps c) and d) are repeated at least once.

7. (Once Amended, Currently Amended) The method of claim 6 in which the windows are in a two dimensional array of rows and columns and in which the first ~~set~~ plurality of windows consists of alternate windows in each row and column.

8. (Once Amended, Currently Amended) A method of forming a mask assembly comprising the steps of:

forming in a substrate a support structure ~~, which includes~~ major and minor struts that define an array of windows , in the form of in a two-dimensional array of rows and columns, by successive rounds of cutting in the substrate a fraction of the total window area to be formed;

filling ~~each~~ such fraction of windows with a temporary fill material before the succeeding round of cutting ~~and filling~~ until all the window areas are cut and filled;

forming a membrane layer over a top surface of the support structure;  
forming a mask layer over the membrane layer; and  
essentially completely removing the fill material from the windows.

9. (Once Amended; Currently Amended) The method of claim 8 in which ~~the~~ a first round of cutting involves cutting approximately one half of the windows to be cut and a second round involves the remainder.

10. (Original) The method of claim 9 in which the first round of cutting is of alternate windows in each row and column.

11. (Original) The method of claim 4 in which the support structure is formed by the steps of:  
placing in a mold which is shaped to facilitate the formation of a support structure a plurality of parallel minor struts; and

forming in the mold a support structure that comprises a frame and plurality of major struts that are orthogonal and attached to the minor struts with the major and minor struts defining a plurality of windows arranged in a two dimensional array of rows and columns.

12. (Original) The method of claim 11 further comprising the step of removing the support structure from the mold.

13. (Once Amended, Currently Amended) A ~~The method of claim 4 in which the forming over the filled-windowed substrate of the membrane and mask layers includes the steps of~~ a mask assembly for use in lithography, comprising the steps of:

a) forming a support structure that comprises a substrate that includes a first plurality of windows;

b) filling the first plurality of windows with a temporary fill material;

c) forming an additional plurality of windows in portions of said substrate which do not contain the temporary fill material;

d) filling the additional plurality of windows in the substrate with a temporary fill material;

e) forming over a surface of a second substrate in turn a layer suitable for the mask and followed by a layer suitable for the membrane;

f) bonding the membrane layer of the second substrate to the first-mentioned filled, windowed substrate in a manner to expose the second substrate; ; and

g) removing selectively the second substrate to expose the mask layer.

14. (Once Amended, Currently Amended) The method of claim 13 in which the second substrate is ~~first~~ implanted with ions to create in its interior an ion-implanted region adjacent one major surface of the second substrate, which one surface is opposite a second major surface to which said mask layer and said membrane layer are applied, and wherein the second substrate is removed in part by cleaving along the ion-implanted region.

15. (Cancelled Without Prejudice)

16. (Once Amended, Currently Amended) A method of forming a mask assembly for use in electron beam lithography comprising the steps of:

forming in a substrate a first set of spaced-apart windows;

filling the windows with a temporary fill material;

forming in the substrate a second set of windows in the spaces between the first set of windows for , thereby forming in combination with the first set of spaced-apart windows a two-dimensional array of windows arranged in ~~row~~ rows and columns;

filling the second set of windows with a temporary fill material;

depositing over the filled-windowed substrate a layer suitable for supporting a mask;

depositing over the ~~last-mentioned~~ layer suitable for forming a mask an additional layer suitable for providing a mask;

patterning the ~~last-mentioned~~ layer suitable for providing a mask, to form a mask ; and

removing the temporary fill from the windows, ~~whereby the mask layer is free of underlying substrate.~~

A,  
cont.  
17. (Once Amended, Currently Amended) The method of claim 16 in which the substrate is ~~chosen~~ selected from the group consisting of aluminum oxide and silicon carbide, the membrane is ~~chosen~~ selected from the group consisting of silicon, silicon nitride, silicon carbide, diamond, and aluminum oxide, and the mask is ~~chosen~~ selected from the group consisting of tungsten and tantalum silicon nitride.

18. (Original) The method of claim 16 in which the major surfaces of the filled-windowed substrate are planarized and made parallel before the deposition of the membrane layer.

19. (Once Amended, Currently Amended) ~~The method of claim 4 in which~~ A method of forming a the mask support structure ~~is formed by~~ , comprising the steps of:

forming in a substrate a set of windows spaced apart by major strut portions ~~of the substrate~~;

forming a plurality of spaced apart grooves in the major strut portions of the substrate; and

placing one of a plurality of minor strut elongated strips in each of the spaced apart grooves.

20. (Once Amended, Currently Amended) A method of forming a mask assembly comprising the steps of:

forming ~~by use of a mold~~ a molded support structure that defines an array of open windows arranged in rows and columns ;

filling the window openings with a temporary fill material;

forming over the support structure a membrane layer;

forming over the membrane layer a patterned mask; and

removing the temporary fill material.

21. (Once Amended, Currently Amended) The method of claim 20 wherein the support structure comprises a frame and major and minor struts which form the array of open windows, and wherein the major struts which are orthogonal to minor struts with the minor struts being placed in the mold prior to forming of the major struts and a the frame which supports the major and minor struts.

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cont.  
22. (Once Amended, Currently Amended) A method of forming a mask support structure comprising the steps of:

forming in a substrate a first set of spaced apart windows;

filling the first set of windows with a temporary fill material;

forming in the substrate a second set of windows located in portions of the substrate between adjacent to the first set of filled windows; and

filling the second set of windows with a temporary fill material.

23. (Once Amended, Currently Amended) A method of forming a mask support structure comprising the steps of:

placing in a mold which is shaped to facilitate the formation of a mask support structure a plurality of parallel minor struts;

forming in the mold a mask support structure that comprises a frame and plurality of major struts, where the major struts ~~that~~ are orthogonal and attached to the minor struts with the major and minor struts defining a plurality of open windows arranged in a two dimensional array of rows and columns; and

filling the open windows with a temporary fill material.

24 - 46.

(Cancelled Without Prejudice)

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